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Takashi Nakai

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EXAMINER

KESSLER, CHRISTOPHER S

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/598,413	Applicant(s) NAKAI ET AL.	
	Examiner CHRISTOPHER KESSLER	Art Unit 1733	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 September 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 15-19 and 22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 15-19 and 22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of Claims

1. Responsive to the amendment filed 10 September 2010, claims 1, 15-17, and 19 are amended and claim 22 is added. Claims 2-14 and 20-21 are cancelled. Claims 1, 15-19 and 22 are currently under examination.

Status of Previous Rejections

2. Responsive to the amendment filed 10 September 2010, new grounds of rejection are presented.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1, 15-19 and 22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 1 requires a step of forming a coating using at least one "material" selected from the group consisting of Al-O, Ti-O, Mg-O, Si-O and CaO. However, this is not what is described in the instant specification. See for example, Table 6 of the instant

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specification, which describes that these are bond elements, and that Al_2O_3 , etc. are the “materials” or components that contain the bond elements.

Each of claims 15-19 and 22 is dependent on claim 1 and is therefore also not described.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1, 15-19 and 22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 requires a step of forming a coating using at least one “material” selected from the group consisting of Al-O, Ti-O, Mg-O, Si-O and CaO. However, one of ordinary skill in the art would not recognize these as “materials.” Instead, one of ordinary skill in the art would know that these are atomic bonds. See for example, Table 6 of the instant specification, which describes that these are bond elements, and that Al_2O_3 , etc. are the materials containing the bond elements. For example, the material Al-O would be exceptionally unstable when exposed to air or even to itself, and would pyrophorically and spontaneously react to form Al_2O_3 based on the entropy of formation of Al_2O_3 compared with that of an Al-O material. The examiner strongly suggests amending claim 1 to be more consistent with the instant specification at Table 6.

Each of claims 15-19 and 22 is dependent on claim 1 and is therefore also unclear.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1, 15-19 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harada, in view of US 2002/0102318 A1 (hereinafter "Sugaya"), and in view of Skiles.

Regarding claim 1, Harada teaches the invention substantially as claimed. Harada teaches a method of power molding (see title). Harada teaches that in the method, the powder to be molded and the molding die are heated, and a lubricant is coated onto the die (see [0007]). Harada teaches that the molding portion of the die is filled with a raw powder and that punches are fitted into the molding portion (see [0018]-[0022] and Figures 1, 2, and 3). Harada teaches that the die is lubricated by dispersing or dissolving a solid lubricant in a solvent such as water (see [0016]). Harada teaches that the lubricant is applied to the molding die by spraying the liquid onto the heated die (see [0019], Figures 1 and 3). Harada teaches that due to the heating of the mold, the fluid in the sprayed lubricant quickly evaporates, leaving a lubricant film on the die (see [0023]-[0024]).

Harada does not teach the step of forming a hydrophilic coating on the molding portion of the mold. Harada does not teach wherein the lubricant is a water soluble lubricant with at least 3 g of solubility for 100g of water at 20° C. Harada does not teach wherein the layer or film formed on the surface of the molding portion is crystallized. Harada does not specify the solubility of any lubricants or the crystallinity of any film.

Sugaya teaches a die used for die compaction of powdered metal (see title, abstract, Brief Summary of the Invention or claim 1). Sugaya teaches that the die is formed with a coating on the molding portion which may include an Al_2O_3 material (see Brief Summary of the Invention or [0017] or [0021]). The Al_2O_3 material meets the limitation of a hydrophilic material comprising an Al-O bond element inherently, because it is the same material as described in the instant claim and specification. Applicant is further directed to MPEP 2112.01. Sugaya teaches that the die is used in order to reduce friction inside the wall of the die and reduce ejection pressure (see [0009], [0007], [or [00021]]). Sugaya teaches that for the compaction step, a lubricant film is added to the coated die surface, and to the metal powder (see [0023]).

It would have been obvious to one of ordinary skill in the art at time of invention to have practiced the method of Harada, and to have used in the method the coated die of Sugaya, because Sugaya teaches that the die is used in order to reduce friction inside the wall of the die and reduce ejection pressure (see [0009], [0007], [or [00021]]).

Skiles teaches a high-temperature water based lubricant. Skiles teaches that the lubricant comprises water, borax, dextrin, and graphite (see col. 2). Skiles teaches that the water is meant to evaporate after delivering the solid components (see col. 2).

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Skiles teaches that the lubricant composition is suitable for use as a die lubricant or mold release in hot operations (see col. 4). Skiles teaches that the borax is dissolved in the water (see cols. 3-4). Skiles teaches that the borax is present in amounts of 0.1-1.0% (see col. 2), thus overlapping the claimed range and establishing a prima facie case of obviousness for that range. It would have been obvious to one of ordinary skill in the art at time of invention to have selected an amount of borax in the range as claimed because Skiles teaches the same utility over an overlapping range. Applicant is further directed to MPEP 2144.05.

It would have been obvious to one of ordinary skill in the art at time of invention to have practiced the method of Harada, and to have used in the method the coated die of Sugaya, because Sugaya teaches that the die is used in order to reduce friction inside the wall of the die and reduce ejection pressure (see [0009], [0007], [or [00021]], and further to have used the liquid lubricant of Skiles, because Skiles teaches that the lubricant composition is suitable for use as a die lubricant in hot operation (see col. 4).

Regarding the limitations of the solubility of the lubricant, Skiles teaches that the solubility of the dextrin is greater than 90% (see col. 2), thus meeting the limitation of the claim. Also, Skiles teaches that the lubricant comprises borax, which also meets the limitation of the claim regarding solubility and meets the limitation of a sodium tetraborate. Applicant is further directed to MPEP 2112.01.

Regarding the crystallinity of the film, formed, the film formed on the die would have had the claimed crystallinity, at least due to the presence of graphite and/or borax,

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both known as highly crystalline materials. Applicant is further directed to MPEP 2112.01.

Regarding claim 15, Skiles teaches that an antiseptic (preservative) is added to the lubricant (see col. 2).

Regarding claim 16, Harada in view of Skiles does not teach wherein a defoaming agent is added. However, the use of defoaming agents in a chemical mixture is not new or innovative. The examiner takes Official notice that it would have been obvious to one of ordinary skill in the art at time of invention to have added a defoaming agent to the composition in order to prevent foaming and improve homogeneity of the mixture during mixing. Applicant is further directed to MPEP 2144.03. Since applicant has not traversed the examiner's assertion that the use of a defoaming agent is known in the art, the common knowledge or well-known in the art statement is taken to be admitted prior art.

Regarding claims 17-18, Harada teaches that the solvent used could be either water or alcohol (see [0016]). Thus it would have been obvious to one of ordinary skill in the art at time of invention to have used a mixture of water and alcohol as the solvent, because Harada teaches that they are functional equivalents. Alcohol meets the limitation of a water soluble solvent. Applicant is further directed to MPEP 2144.06.

Alternatively, Skiles teaches that the composition may include one or more solvents such as water or other hydrocarbons (see col. 4). Thus, the use of an alcohol such as a methanol or ethanol would have been obvious to one of ordinary skill in the art as the most simple species in the genus of hydrocarbon solvents.

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Regarding claim 19, neither Harada nor Skiles teaches that a halogen element should be included. Thus, the disclosures of each of these references would have led one of ordinary skill in the art to have excluded a halogen element.

Regarding claim 22, Harada teaches that the die molding portion is heated to a temperature of up to 350, or 300, or 250, or 200 °C, and at least 170, or 200 or 230°C (see [0012]). Thus, the temperature range taught by Harada overlaps the claimed range, establishing a prima facie case of obviousness for that range.

9. Claims 1, 12-16 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harada in view of Sugaya, and further in view of Murata.

Regarding claim 1, Harada teaches the invention substantially as claimed. The teachings of Harada in view of Sugaya are discussed above.

Harada does not teach wherein the lubricant is a water soluble lubricant with at least 3 g of solubility for 100g of water at 20° C. Harada does not teach wherein the layer or film formed on the surface of the molding portion is crystallized. Harada does not specify the solubility of any lubricants or the crystallinity of any film.

Murata teaches a waterborne lubricant used for working metals (see p. 1). Murata teaches that the lubricant can be used to coat and lubricate tooling for metal working (see pp. 2-3). Murata teaches that the water borne lubricant comprises water and an inorganic salt (see p. 3). Murata teaches that the inorganic salt may comprise any water-soluble inorganic salt that forms a suitable coating, such as sodium tetraborate or sodium sulfate (see pp.4-5). Murata teaches that the special composition

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of the lubricant reduces the friction between the workpiece and the tool to reduce seizure (see p. 11). Murata teaches that the composition comprises 5-45% solids (lubricants), the rest being water (see p. 8). Murata teaches that the ratio of oily component to solid lubricant and inorganic salt ($C/\{A+B\}$) is in the range of 0.05:1 to 1.0:1, and that the surfactant comprises 0.2 to 5% of the lubricant (see p. 8). Thus, the composition of the inorganic salt overlaps the claimed range establishing a prima facie case of obviousness for that range. It would have been obvious to one of ordinary skill in the art at time of invention to have selected an amount of sodium sulfate or sodium tetraborate in the range as claimed because Murata teaches the same utility over an overlapping range. Applicant is further directed to MPEP 2144.05.

It would have been obvious to one of ordinary skill in the art at time of invention to have practiced the method of Harada, and to have used in the method the coated die of Sugaya, because Sugaya teaches that the die is used in order to reduce friction inside the wall of the die and reduce ejection pressure (see [0009], [0007], [or [00021]]), and to have used the liquid lubricant of Murata, because Murata teaches that the lubricant composition reduces the friction between the workpiece and the tool to reduce seizure (see p. 11).

Regarding the limitations of the solubility of the lubricant, Murata teaches that the lubricant may comprise sodium tetraborate or sodium sulfate (see pp.4-5), which meets the limitation of the claim regarding solubility. Applicant is further directed to MPEP 2112.01.

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Regarding the crystallinity of the film, formed, the film formed on the die would have had the claimed crystallinity, at least due to the presence of sodium tetraborate or sodium sulfate, both known as highly crystalline materials. Applicant is further directed to MPEP 2112.01.

Regarding claim 15, Murata teaches that an antiseptic substance (preservative) is added to the lubricant (see p. 7).

Regarding claim 16, Murata teaches that a defoamer is added to the lubricant (see p. 7).

Regarding claim 22, Harada is relied upon as stated above.

Double Patenting

10. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

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11. Claims 1 and 15-19 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 15, 16, and 20-23 of copending Application No. 10/531,813, in view of Sugaya. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of applicant's prior application are silent with regards to the limitations of claim 1 of solubility of the lubricant. However, claim 1 of said prior application and the instant claims list many of the same compounds to act as lubricant. Thus, the commonly claimed lubricants must inherently have the claimed features. It would have been obvious to one of ordinary skill in the art at time of invention to have practiced the invention of claim 1 by combining the embodiments in the various claims of applicant's prior patent.

Applicant's prior application does not teach wherein the coating of hydrophilic material is applied to the die.

Sugaya teaches a die used for die compaction of powdered metal (see title, abstract, Brief Summary of the Invention or claim 1). Sugaya teaches that the die is formed with a coating on the molding portion which may include an Al_2O_3 material (see Brief Summary of the Invention or [0017] or [0021]). The Al_2O_3 material meets the limitation of a hydrophilic material comprising an Al-O bond element inherently, because it is the same material as described in the instant claim and specification. Applicant is further directed to MPEP 2112.01. Sugaya teaches that the die is used in order to reduce friction inside the wall of the die and reduce ejection pressure (see [0009],

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[0007], [or [00021]]. Sugaya teaches that for the compaction step, a lubricant film is added to the coated die surface, and to the metal powder (see [0023]).

It would have been obvious to one of ordinary skill in the art at time of invention to have practiced the method of 10/531,813, and to have used in the method the coated die of Sugaya, because Sugaya teaches that the die is used in order to reduce friction inside the wall of the die and reduce ejection pressure (see [0009], [0007], [or [00021]]).

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Response to Arguments

12. Applicant's arguments filed 10 September 2010 have been fully considered but they are not persuasive.

Applicant argues that the new claim limitations are supported in [0061] and Tables 4 and 6. However, the specification teaches something different from what is claimed. Applicant is directed to the rejections under section 112 above.

In the remarks of 10 September 2010, at page 11, Applicant makes the following statement:

First, Harada does not disclose any lubricant. Second, amended claim 1 does not recite any borates, including borax disclosed by Skiles, as a water soluble lubricant. Accordingly, the 103 (a) rejection of claim 13 and its limitation based on the combination of Harada and Skiles is moot.

The examiner disagrees with these statements because they are false. Harada discloses the use of a lubricant at [0016] for example, though Harada does not disclose the lubricants as claimed. However, claim 1 quite clearly recites a sodium tetraborate,

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which is the same material used by Skiles and Murata. Thus, the specific lubricant element of claim 1 is taught by Murata or Skiles.

Applicant further argues that the range taught by Skiles applies to all the components, and thus the claimed amount of 0.01% by weight up to saturation concentration is not obvious. The examiner disagrees. While Skiles does teach that said range applies to all the components, the amount of borax taught by Skiles still overlaps the claimed range, said claimed range being very broad.

Applicant argues that the molding at temperature of at least 250 °C would not be possible without the hydrophilic coating. The examiner disagrees with this statement as Harada clearly envisions overlapping temperatures (see [0012]). However, this argument is moot because of the new grounds of rejection.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER KESSLER whose telephone number is (571)272-6510. The examiner can normally be reached on Mon-Fri, 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ Roy King/
Supervisory Patent Examiner, Art
Unit 1733

csk

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